

# CRICKET

MAY 1981

## IN KEEPING WITH OUR POLICY OF 'FIRST CLASS AFTER SALES SERVICE' HERE IS OUR 3RD (SEE BELOW) SERVICE BULLETIN FOR "CRICKET" OWNERS

First we should explain that, although this is bulletin #4, there have only been two previous ones. We 'kinda' lost #2 on the way in our numbering system. Hope this clears up the case of the missing (which really wasn't) bulletin. Second, for new owners, we want you to know that the primary purpose of these bulletins is to provide corrective information to "Cricket" owners when field reports show that a building or flying problem exists or is arising. Finally, we will try and give you some news of what is happening with "Cricket" flyers around the world. So let's tackle this one first and then get on with the hints and tips section.

### AROUND THE WORLD

"Cricket" is now flying in the following countries and the reports coming in show that our American design is being well accepted and appreciated overseas:

Holland	Sweden	Belgium	South Africa	England
Germany	Australia	Austria	Chile	Canada
Argentina	France	Switzerland	Japan	New Zealand

Some examples of initial overseas reactions to "Cricket" are:

- a Belgian import company - "congratulations your achievement 'Cricket' - it flew beautifully".
- a Swiss import company - "our congratulations for such a nice kit!"
- a South Africa hobby company - "have now flown my 'Cricket' and must congratulate you on an excellent design".
- a Dutch import company - "very fine quality kit"
- a German import company - "we are very interested in importing your 'Cricket'".
- an Australian import company - "a great little helicopter".

We also now have export enquiries from many more countries, including Russia!

Although primarily designed to be a beginners helicopter, "Cricket" is now being well accepted as a sports and fun machine for many of our accomplished flyers. For instance, the following 'old timers' now own and fly "Cricket":

Don Chapman	Bill Ellis	Bill Youmans	Grady How
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We agree fellows - apart from being a fine beginners helicopter, "Cricket" also fills the need for an inexpensive (to buy, run and repair) fun machine. We are happy to see this, too, of course.

### NEW ITEMS

#### "Cricket" Seats

We now have the seats ready. They are made of vacuum formed thick clear plastic - you spray your color choice on the back side. List price is \$3.95 each.

#### "Cricket" Heat Sinks

We always maintain a stock of our own heat sinks for 'O S 25 FSR' and 'Super Tiger #25'. We'll probably carry one for the 'K & B 3.5' soon. List price is \$12.50 each.

#### "Cricket" Mufflers

"Cricket" was designed specifically to use standard 'off-the-shelf' mufflers. But the 'K & B 3.5' is a special case because of its rear exhaust port. 'Tatone' now makes a special "Cricket" muffler so that you can now use the 'K & B 3.5' engine in your "Cricket". Your "Cricket" dealer will either have these in stock or can get you one fast. List price is \$18.95 each.

### "Cricket" Rigid Blade Straps

The "Cricket" has free swinging blade straps, as you know. This is great for the beginner because it saves blades breaking. It is also okay for fast or aggressive flying if the main blades are identical in all respects - not just balanced across the span. Sometimes this is not so and a vibration of the helicopter results. If this happens with a particular set of blades you can tighten up hard the single fixing bolt and set the blades to be exactly opposite each other (180 degrees). This will eliminate vibration in hovering and during slow forward flight. For aggressive flying (tight turns, quick stops, loops, etc.) even this doesn't fix it because one blade will be pulled out of line with the other and, of course, it now stays that way until we land because we tightened up the bolts! So we get vibration again. So the safest way for the guy who flies around fast with his heli is to attach the blades rigidly to the head. We have now in production a new blade strap with a double hole at the seesaw end. You only really need two of these new straps (not four) and you fit them on each side on the top only. Then you must drill corresponding holes in the seesaw and fit two 3mm bolts and nuts. The part number for the new straps is 188 and they come two in a package for \$1.95.

### "Cricket" Aerobatic Head

As many of you may have seen at the trade shows, we have now developed a really neat, independent blade feathering, 'Bell-Hiller' rotor head. This could give "Cricket" more aerobatic performance and, if fitted with several more rods and levers, collective pitch control too. But now "Cricket" will weigh about 8 - 10 ounces more and will be much more complex to set-up. We are now coming around to the opinion that we should keep "Cricket" as it is - a simple, light, remarkably responsive helicopter. But don't get disappointed yet. We are now flying a very simple new 'Bell-Hiller' head which will only add about 2 ounces of weight and which will improve "Cricket's" handling and aerobatic ability. This head could also sell for much less money - say \$30 instead of \$60 for the fully feathering one. So please be patient a little longer and we will advise you through your dealer and/or by advertising on what we came up with. Oh, the new collective/'Bell'/'Hiller' super head. Well, we have a real good use for it. Watch us for its use in something really new in R/C choppers available in the fall.

Now to the support part of this bulletin - for those who are having problems. We will cover the building problems first.

### BUILDING

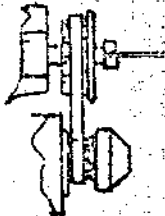
#### General

We still come across some "Crickets" which reportedly don't fly very well and we find, in nearly every case, the builder hasn't quite realized that his building must be precise and exactly to instructions (unless he has a prior expertise in R/C helicopters). No model R/C helicopter can fly, if the linkages are too stiff or too sloppy or if the tail drive wire is jammed between the front and rear bearing so that it is compressed and bowed all the time it is running. Or if the main shaft has been bent but not corrected. Or if the control movements are much too small. Be fair, fellows (or girls), "Cricket" must be built accurately and the instructions must (at least initially) be followed. We guarantee it will make all the difference in the world. If you cannot quite get it together, it's worth even a longish journey to get with an experienced flier and seek his help. "Cricket" will for sure fly and fly well if it is built and adjusted properly.

#### Engines

We have now tested the following engines in "Cricket": 'O.S. 25 FSRE', 'Super Tiger X25', 'O.P.S. 21 Car', 'H.B. 21 POP', 'K & B 3.5', 'H.P. Gold Cup 20', 'Webra Speed 20' and 'Enya 21 X EV'.

When you install any engine just be sure that the two plastic pulleys, which carry the belt drive, line up vertically so that the belt cannot foul on the main plate or the starting cone. You can obtain extra spacing washers, part number 137, if you need them or you may have to drill new mounting holes in the main frame to suit your engine. We try to cater for most popular engines, but a little custom work may be needed for some installations.



### Center of Gravity

"Cricket" was carefully designed so that the 'CG' would fall on the main shaft (where it should be) when a pilot doll, a seat and a standard radio with a 450 mAh battery are used. Naturally, extra weight must be added in the nose as far forward as possible if the doll is omitted or is lighter, etc. So please do balance "Cricket" carefully so that the CG is in the correct position. Check it by pivoting the helicopter on the under surface of the black plastic gear (fingers are okay as a pivot point). This is the most accurate way. Suspending "Cricket" by its flybar can give misleading results because a large CG error will only result in a very small angular tilt in the helicopter (honest!).

### Plywood Parts

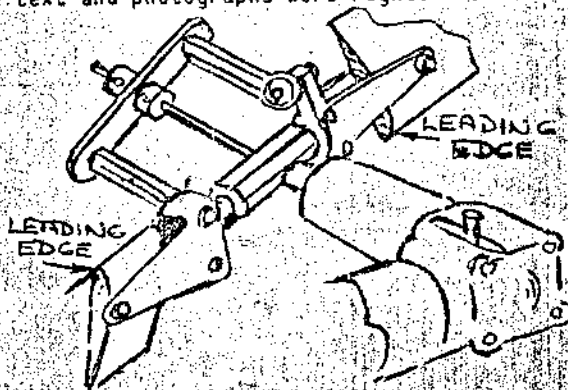
Originally it was intended that the four servo mounting parts should be glued together, but that this unit should not be glued to the rear bulkhead. However, if you glue the whole lot together, it does make a more rigid front end and it seems to present no problems when removing the whole front radio installation. You just have to remove the screws holding in the front bulkhead, too.

### Flying Weight

Weight is the enemy of flight - no one would disagree on this, we suppose. So keep "Cricket" as light as possible. As designed, "Cricket" will weigh between 4.2 and 4.5 pounds. At this weight, with a good 25 engine, it will lift off at sea level about 1/3 throttle. Add more weight and performance suffers. At 5 pounds "Cricket" would just about fly okay at sea level and, if even heavier, it probably won't fly well at any altitude. It was designed to be a 4 to 4 1/2 pound helicopter, without a 20% loss of power for the cooling system. So this is equivalent to a 3 3/4 to 4 pound helicopter with a cooling fan system. Some builders have also installed quite heavy 'training gears' using sticks and balls. Well, okay, except the 'training gear' must be light. Please note that "Cricket's" landing gear was designed to be a training gear. It's very wide and the skids are long. Try learning with just the standard gear.

### Tail Blade Installation

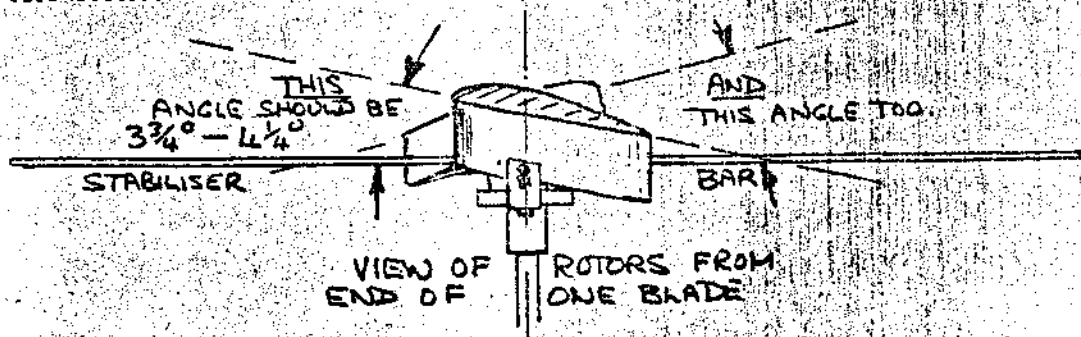
Still more confusion on this one. The center drawing in all "Cricket" manuals (up to a serial number of about 2000) was wrong, even though the text and photographs were right. Here's how the tail blades and holders should be installed:



If your's are reversed to this, it is worth changing since you will be experiencing a limited throw in one direction which will then be corrected.

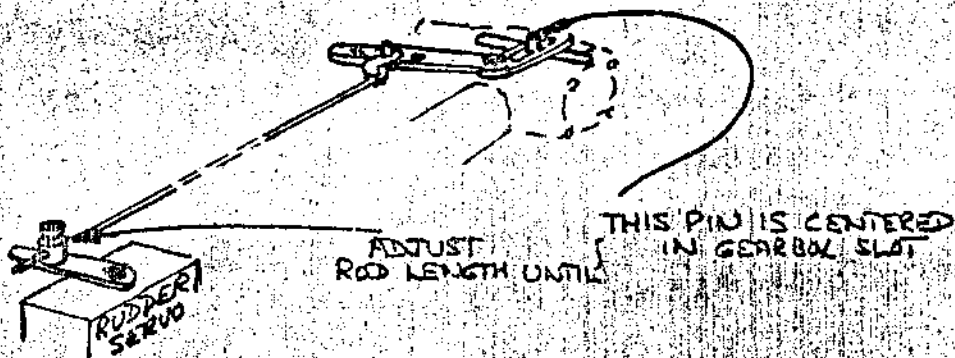
### Adjustments

There are still a few "Cricket" builders who are experiencing some set-up problems. Most of them have never built any control models before and our instructions assume a basic knowledge of setting up planes and cars. The two major areas of confusion seem to be setting the pitch of the main blades and setting the pitch and datums of the tail blades. Some builders have suggested a simple sketch of the main blade set-up. Okay, here it is:

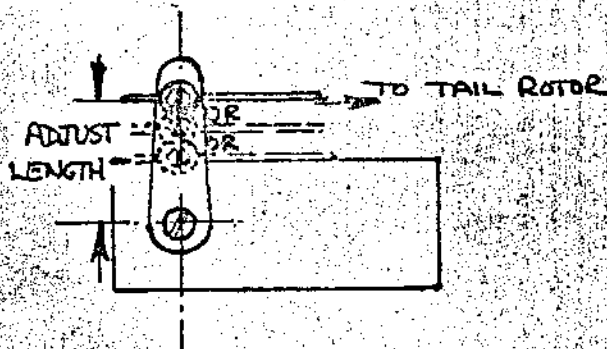


For the tail blades, here it is again:

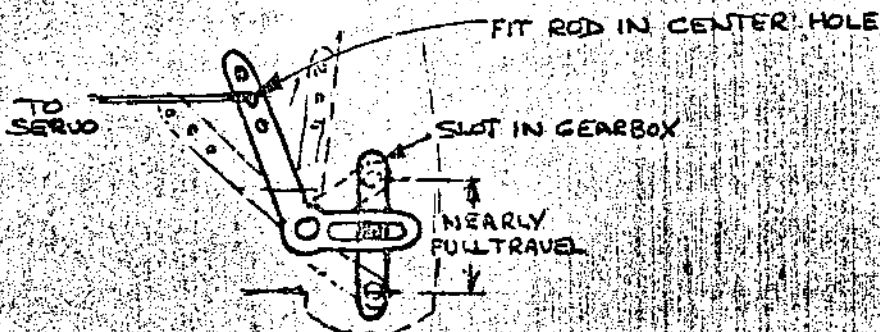
- 1) Set the rudder servo arm at neutral position and, at this setting, the 1/16" dia. control rod from the rudder servo to the tail control lever should be adjusted in length until the pin in the gearbox slot is centered:



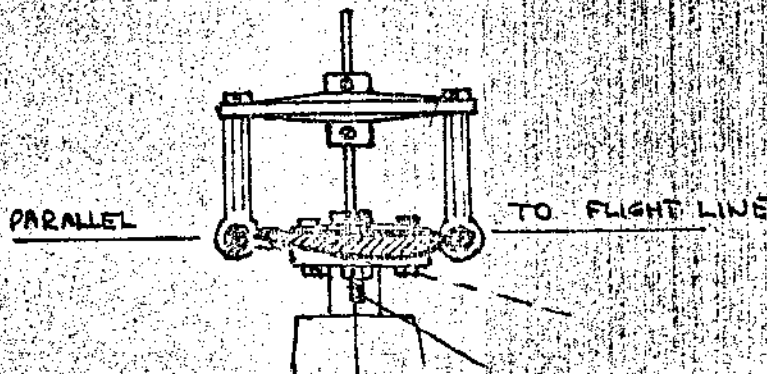
- 2) Now, don't touch the adjustments made in (1) again but do the following: Adjust the length of the rudder servo arm (the distance from the pivot point that the tail wire is fixed)



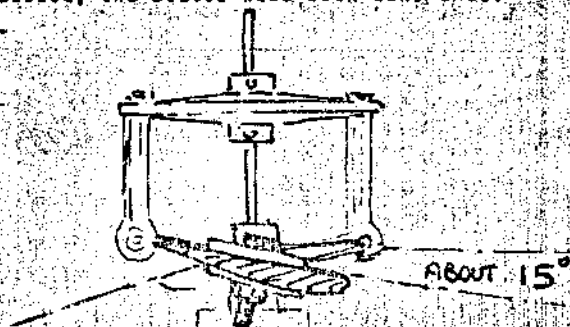
so that with full left to right rudder stick movement, the pin moves nearly the full amount of the movement that the slot will permit:



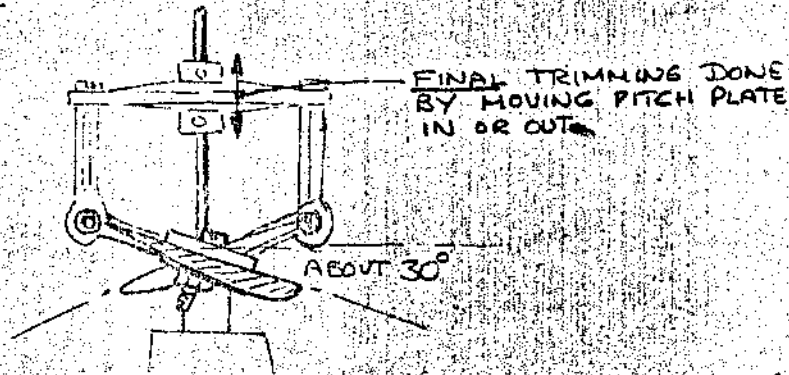
- 3) Now, don't touch (1) and (2) again. Set the 1/16" collars (or nuts if your "Cricket" is fitted with them) so that with full left stick on the transmitter, the flat surface of the tail blades are parallel to the line of flight:



4) When the rudder stick is neutralized, the blades will look like this:



and when the rudder stick is full right the blades will look like this:



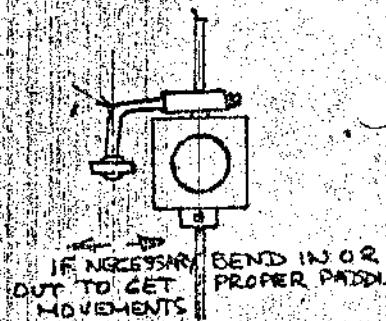
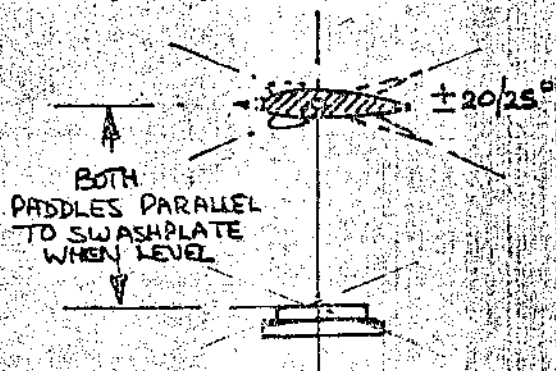
Hope the above will do it this time. It is confusing, we know, and we really want you to get it right.

## FLYING

### Slurpish Response

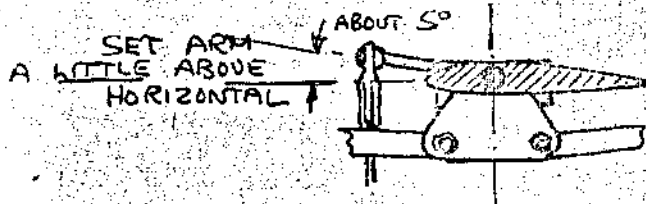
Check: Head is free in all respects;

Check: Paddles move approximately 20/25 degrees for swashplate pitch and/or roll movements. It's the par movement which gives response and maybe you will have to experiaent a bit by bending the flybar control arm in or out from the head to produce a large enough paddle movement:



Check: Both paddles are in line with each other and parallel to the swashplate.

Check: That the ball link on the flybar control arm doesn't foul on the seesaw hole for large swashplate angle. You can set the flybar arm a little above level at neutral to achieve this:





### Tail Rotor Commands Uncertain

If your "Cricket" seems to need more and more right turn tail command as you fly, check that the tail rotor hub is still fixed firmly to its shaft. It is screwed on with a left hand thread and sometimes this can unwind slowly, especially after a tail strike on the ground. To fix it, do the following:

- a) Undo the 4mm dog point screw at the front end of the tail drive wire.
- b) Disconnect the tail control wire from the control lever on top of the tail gearbox.
- c) Undo the clamp holding the tail gearbox to the tail tube and remove the gearbox and wire.
- d) Clamp the steel drive coupler in a vise (use vise clamps if the jaws are serrated). Hold the gearbox itself in your hand and you will be able to unwind the rotor hub by turning it clockwise (it's a left hand thread - don't forget).
- e) Clean the threads on the shaft and in the hub with alcohol or a grease solvent.
- f) Put some blue 'Loctite' on the thread and tighten up firmly.
- g) Re-fit the tail gearbox and drive wire.

You might want to check that the screws holding the tail drive wire at the rear are tight before refitting the assembly; also that the wire is straight and runs true.

### Tail Boom Breakage

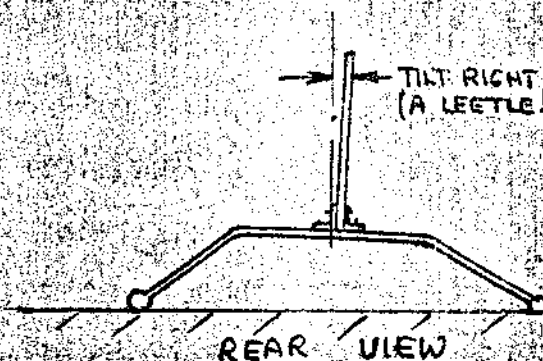
There have been some breakages of tail boom at the point where the tail drive wire exits the tube. Our investigation shows that in most cases this was due to the tail drive wire being compressed between the front and rear fittings. This results in a bowed wire which can 'slap' around in the slot of the tail boom. This 'slapping' causes fatigue in the tube. The breakages seem to be mostly in isolated cases. We have made the slot narrower so as to further resist fatigue. To avoid the problem of a 'compressed' tail drive wire, we suggest you check quite often that the drive wire is not in compression or tension by loosening the 4mm dog point screw at the front end and then retighten it again. This will allow the wire to take up its natural length and remove any strain which could cause vibration wear or friction.

### Lubrication

Please don't forget to lubricate your "Cricket" regularly. A thin machine oil should be used on the rotator tail parts, especially where the pitch control plate rotates on the tail control wire. Also, don't forget to lubricate the wire itself. The same oil should be used on all the rotor head moving parts. A light weight high speed grease should be injected into the tail gearbox at the top slot from time to time but be careful not to overfill.

### Pulling Left on Takeoff

Some flyers complain about the helicopter sliding or pulling left just at takeoff. This is absolutely fundamental to all choppers (left or right, depending upon rotation of main rotor blades). The cause is that the tail blades pull sideways as well as producing an antitorque force. But here's a good trick to help you solve the problem. Tilt your "Cricket" slightly to the right by bending the main landing gear cross struts. Then, you see, the tilt to the right will offset the slide to the left and you'll lift off straight. Try it!



Good luck to you and stay in touch!

*John Gorham*

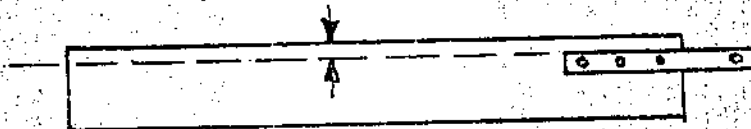
### Hints & Tips Potpourri

The standard "Cricket" loops well, by the way. You must have plenty of paddle movement in pitch (elevator axis) and a well running engine. Get plenty of height and forward speed, pull back and loop like you would a glider (keep the forward speed up). Remember, since "Cricket" will slow down during a loop, some right tail rotor will be needed in order to keep the loop straight.

Note: Don't try loops until you are competent in general forward flight flying and maneuvers.

- A great tip for "Cricket" flyers who live at high altitudes: try the 'K & B 3.5' with the 'Tatone' muffler (tail pipe drilled out to 5/16" dia.) and use 'K & B' racing fuel. Seems this really boosts the power.
- Another spectacular flight maneuver for "Cricket" is the 'dishpan'. You put "Cricket" into a tight descending right hand turn and keep adding right tail rotor until your helicopter is turning 'round and round' nose in to the center of the turn, and tilted nose-down. By adjusting throttle you can keep "Cricket" doing this and also holding its altitude.
- A Blade balancing tip: first you balance the main blades by pivoting the whole head assembly on the flybar as the instructions suggest. Then, if there is a little vibration after this when in the hover, try adding a wide strip of blade covering material all the way around one blade at its center (strip will be about 4" long). Then hover again. If the vibration is better - great! If not, remove the strip and put it on the other blade. Better? No? Then take it off - you were balanced fine in the first case. The vibration is due to either the flybar not being balanced or the main blades not being lined up. Remember the sides of the blade straps must be parallel to the edges of the blades. If they are not, then loosen the three bolts holding the blade, line up the blade straps and retighten.
- Remember, any loose blade covering or a crushed-up blade tip can cause all sorts of vibration problems, tracking problems and loss of lift. So keep the blades tidy and smooth.
- Some people still seem surprised about the need for 2 - 3 ounces of ballast in "Cricket's" nose to get the right. We repeat: we designed "Cricket" to balance properly with a seat and a 4 ounce pilot in front. With either you will need about 3 ounces of ballast as far forward as you can get it.

MUST BE PARALLEL



**GMP**

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